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apply as vigorously as the surgeon the rules of antiseptis and aseptis." We are convinced that while, in an experimental course carried out by students, it is perfectly feasible and of great utility to insist upon rigid antiseptic precautions in such experiments as require it, they not only introduce an unnecessary complication in cases in which the animal is to be sacrificed, but often interfere seriously with, and always distract the attention of the student from the real object of the observation. Further, most of the work on mammals which can and ought to be performed by students is of such a nature that a strict adherence to antiseptic technique throughout the whole experiment is practically impossible. If the argument that "it is a bad discipline to have two styles of operation, since certain details of the antiseptic method will be fatally neglected when one wishes in exceptional cases to apply it," be a sound one, we ought seriously to enquire whether the reckless custom of wearing one sort of dress in summer and another in winter is not very likely to result in a fatal confusion of times and seasons, muslins and mackintoshes, shirt-waists and sealskin coats, and to lead to such awful inversions as ducks in December and ulsters in July, or whether any man who respects his stomach and has a conscientious regard for the interests of his insurance company, can afford to permit his cook to dabble at the same time in the cumulative mysteries of roast and boiled.

G. N. I. S.

The Home Life of Wild Birds. A New Method of the Study and Photography of Birds. By FRANCIS HOBART HERRICK. New York and London, G. P. Putnam's Sons. 1901. Pp. xiii + 148.

In 'The Home Life of Wild Birds,' Francis Hobart Herrick has given us a most valuable treatise and one which is sure to be of the greatest assistance to those who are following the perplexing pastime of bird photography. The author states the truth when he says that animals should be studied as animals and not as if they were human beings. If some others had shared this commendable belief, an enormous amount of trash would be absent from the book shelves and consequently seekers

of truth would be saved a corresponding amount of annoyance. We have no objection to well-written fairy tales, fables, or stories of personified animals, but when an author states or implies that his human thinking and acting animals are truthfully portrayed, and the alleged facts are taken from nature, then we consider he should be most severely criticised.

Taking advantage of that force which for convenience we term parental instinct, Mr. Herrick overcomes the chief difficulty that besets the bird photographer. The method is to remove the nest from its surroundings, whether it be in the tall tree, deep wood, swamp or impenetrable brier patch, and set it up in a good light, so that the branch or other support of the nest will occupy the same relative position as in the old site. It was found that the parent birds soon got used to the new surroundings and attended the young as if nothing unusual had happened. By the aid of a green tent which concealed the operator and outfit, and when in use was open only at a point in line with the lens, the affairs of the little family could be observed with perfect ease at a distance of only a few feet. In this manner the author spent what must have been many happy days in observing the interesting movements that were taking place in and about the nests of the robin, cedarbird, kingbird, chestnut-sided warbler, bluebird, brown thrasher, red-eyed vireo, nighthawk and many other species.

The 137 pages which detail these experiments are full of valuable facts and suggestions and will surely be welcomed by those who care to learn the mysteries of bird life. The numerous photographs which enliven the book, with the exception of a few distorted on account of the nearness of the object, are admirable, and in connection with the text undoubtedly will stimulate many to seek a fascinating recreation so well described and illustrated in this volume.

A. K. F.

WASHINGTON, D. C.

DISCUSSION AND CORRESPONDENCE.

THE COAST PRAIRIE OF TEXAS.

THIS physiographic feature, which extends for a distance of nearly four hundred miles, from

western Louisiana through Texas into Mexico, is one of the newest made and least understood of our American geographic provinces.

In topographic aspect it is apparently an almost level plain sloping at the rate of about one foot to the mile seaward, but within its area there are slight irregularities or undulations, hitherto unnoticed or at least not described, which are now attracting great attention, owing to their supposed relation to the occurrence beneath them of oil.

The Louisiana extension of the prairie is generally acknowledged to be a subsiding land as attested by actual bench marks, by the drowned character of the bayous and by the cycles of cypress growth on the swamps. I know of no actual previous observations bearing upon the isostasy of the Texas portion of the prairie, but McGee in a recent article in the *National Geographic Magazine* assumed that it was also subsiding.

I have just made some observations, however, which lead me to believe that west of the Trinity river, at least as far south as the mouth of the Colorado—beyond which we know nothing—the plain is rising.

Between the Trinity and the Colorado all the streams have new-cut channels, characteristic of rising land, while the Brazos is actually cutting down through its own alluvium at sea level and for many miles above its mouth. Not only is the coast prairie now undergoing differential movement—subsiding in one part and rising in another—but there is strong evidence that it is being wrinkled and folded, the strata so affected being so recent in age that they cannot be assigned to any other period of time than Pleistocene or recent. These folds are so slight that they could never have been detected had it not been for the discovery of oil on Spindletop Hill, four miles south of Beaumont, by Captain A. F. Lucas, in January last.

When this gentleman endeavored to point out to me this hill, my trained topographic eye could hardly detect it, for it rises by a gradual slope only ten feet above the sea of prairie plain which surrounds it. I was still more incredulous when Captain Lucas insisted that this mound, only two hundred acres in extent, was a dome, and that it had been uplifted by the

pressure of gas from the great pool of oil now proved to be coincident in extent beneath it. Captain Lucas said that I should be convinced of the uplift if I could see Damon's Mound in Brazoria County. I have just returned from Damon and a second look at Spindletop, and am convinced that if these hills are not recent quaquaversal uplifts no other hypothesis will explain their existence.

Damon's Mound is an elliptical oval hill a mile or more in greatest diameter. It rises ninety feet above the surrounding level plain. Its profile is everywhere convex instead of concave, and it is not a hill of erosion or of volcanic material. Furthermore, a bed of limestone follows the contour of its surface, showing deformation. The ascent of the plain will not carry the latter to the height of this mound for one hundred miles interiorward. The oil men have insisted on this structure and are spending \$200,000 upon Damon's Mound alone, merely upon their belief that its structure is anticlinal. Not only this, but they have seized upon every hill of this character on the coast prairie of western Louisiana and Texas, and are sinking at least 100 wells at an expense of \$10,000 a piece to demonstrate their theory.

Concerning the stratigraphy of the coastal plain, it can only be said that at Galveston it is composed of at least 3,000 feet of unconsolidated land, derived sands and clays, with occasional lignite logs and estuarine shells. All this is later than the Eocene Tertiary—the last datum point we have in the Tertiary and Pleistocene stratigraphy of Texas. Of this thickness Harris has shown 2,000 feet to be post Tertiary or not proved as old as Tertiary. Fossils from the Beaumont wells, depth 1,030 feet, have been assigned to the 'Neocene,' but as 'Neocene' means nothing—being merely a word to conceal our ignorance of all the later Tertiary strata of the United States—the position of the oil is still uncertain. It is my opinion that the oil is in strata which may as well be called Pleistocene or recent. They are certainly later than any proved Tertiary strata.

One thing is certain. This oil occurs in underground pools, and another thing is probable, that these pools underlie dome-shaped anti-

clines in the new-made recent coast prairies. Furthermore, these uplifts are most probably due to isostatic movements rather than to accumulations of gas.

Another interesting fact which is developing is that these oils are not associated with extensive beds of either plant or animal remains, but at one place, Saratoga, where they outcrop, they apparently originate in ferruginous sands, and this occurrence is strikingly suggestive of Mendeleef's theory that petroleum is formed by the action of warm waters on carbide of iron at considerable depths. But conclusions on this subject are as yet premature.

ROBERT T. HILL.

DISCORD AND BEATS.

TO THE EDITOR OF SCIENCE: In a review of books on physics in a recent issue of SCIENCE, I find on page 259 the remark that the author "has defined 'discord' more sharply than the facts warrant, by failure to recognize Mayer's law, which expresses the duration of the residual auditory sensation as a function of vibration frequency, the equation being expressible in a curve which Professor Mayer published in 1894 (*Am. Jour. Sci.*, Jan., 1894)." That authors of text-books of physics discuss *psychological* problems may be very well; for it is certainly better for the student to learn some psychological theories in the physical laboratory than to learn them not at all. But, unfortunately, it is rare to find a physicist who is sufficiently familiar with the psychological literature. Permit me to make these two statements: (1) That a 'discord' cannot be defined by 'beats,' the psychologists have some time since agreed upon. The physicists—on the authority of Helmholtz, whose 'Tonempfindungen' appeared 40 years ago—still make use of this definition. (2) Mayer's curve, as recent experiments (*Zeitschrift f. Psychol. u. Physiol. d. Sinnesorgane*, 20: 408-424; reviewed in the *Psychological Review*, 7: 88-90, 1900) prove, does not express the dependency of the duration of an after-sensation on the frequency of vibration. The duration of the after-sensation does not seem to depend upon the pitch at all.

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THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

TO THE EDITOR OF SCIENCE: Can nothing be done even at this stage to secure a better system of classification for the international catalogue of scientific literature now under process of preparation under the general supervision of the Royal Society in London? In library management this country is, as probably every one is aware, in advance of most, if not all, countries, and the result of this is that the practical application of the science of classification to the cataloguing of books and articles has been carried farther in this country than elsewhere. Published systems of classification here are more complete, there is a larger literature on the subject, and a greater number of libraries have been catalogued on a classified system. I do not think anybody familiar with classification and its practical application will hesitate in condemning the classification which has been adopted by the Royal Society. In botany, it is ridiculously incomplete. It is impossible, as I know from experience, to classify material on this subject, in the shape of papers, without a system which is at least carried down to families; and in many cases one extended to genera is wise.

The classification in geology is equally inadequate and makes insufficient provision for the great extension which has taken place in physiographic geology in the last ten years.

If any one wishes to see what can be done in the line of careful classification for geological purposes, M. Mourlon's 'Classified Index of Geological Papers' on the Dewey Decimal System will offer a striking contrast to that presented by the meager array of classification in the Royal Society. Mnemonic aids are altogether omitted in this classification, no common system of number being used for common types of classification in different subjects. In the biological field, no effort has been made to follow a similar arrangement of homologous subjects.

In fact, I think, I speak within bounds in saying that no one versed in this subject can examine this classification without feeling that it is prepared by some one who has neglected to study what has already been done in this field.